Tomorrow's office, today's technology

British computer network dealer realizes substantial benefits from adopting the Apple-based Nestar network it sells

You don't have to be a Fortune 500 corporation or a large company with multiple locations to reap rewards from a network system, according to the management team at Zynar, Ltd., a British dealer in local computer networks. Zynar recently adopted one of the systems it sells in the United Kingdom and Europe—the Cluster/One from Nestar, Inc., Palo Alto, Calif.

Using Cluster/One, Zynar has been able to control personnel and overhead costs, which would otherwise soak up the narrow profit margin common among computer hardware dealers. The system, built around an Apple II μp, has not only allowed Zynar to operate with a staff of 17, but has also eliminated the need for many of the extraneous and time-consuming reports, memos and staff meetings required in most business operations.

The Cluster/One network

Nestar's Cluster/One is a hard-wired network of as many as 65 stations that share a Nestar disk-storage system. One station is designated as a disk-server, transferring programs and data between the disk

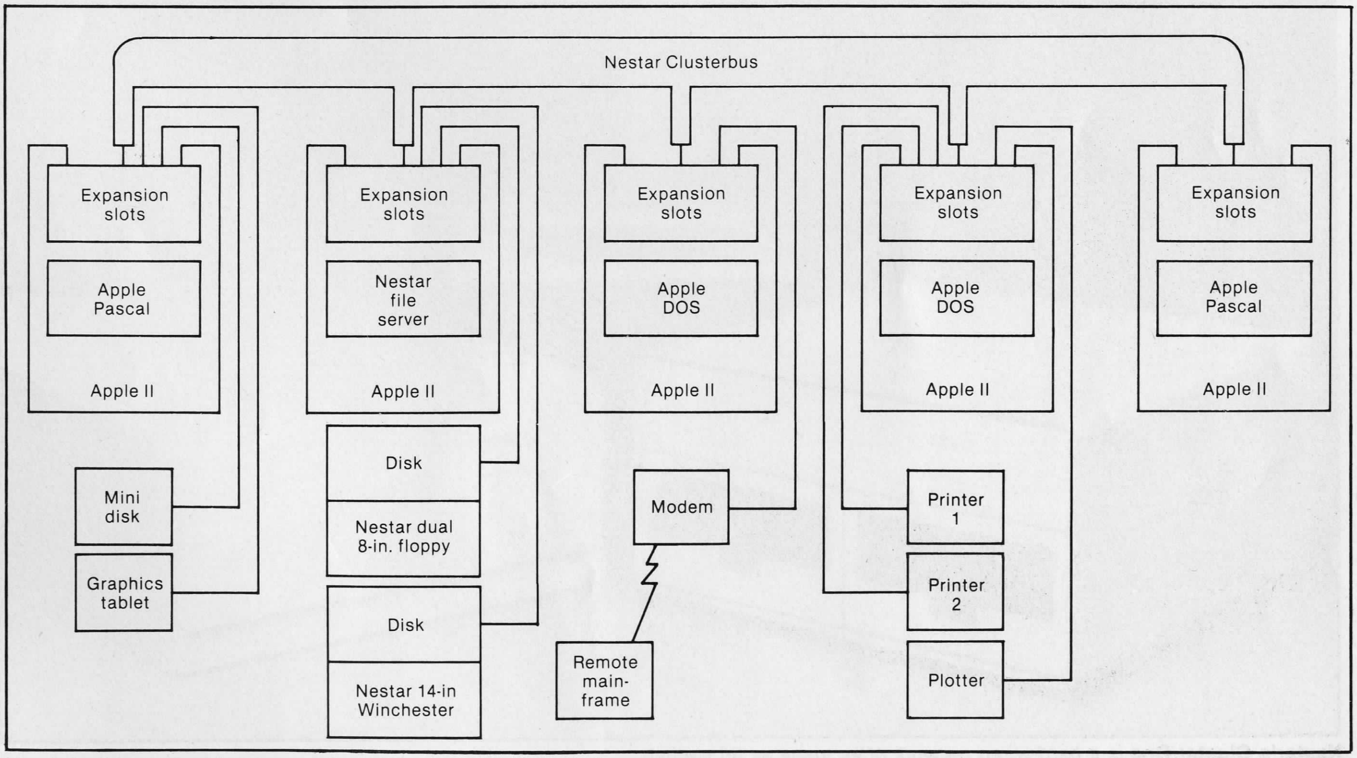

Fig. 1. In this typical Nestar *configuration, there is no centralized control. Any number of stations may provide services for other stations on the network, and "servers" may be "clients" of other servers.*

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storage and other μc user stations. These user stations are independent computers with full local storage and computing capabilities during all operations except transfers to and from the disk server.

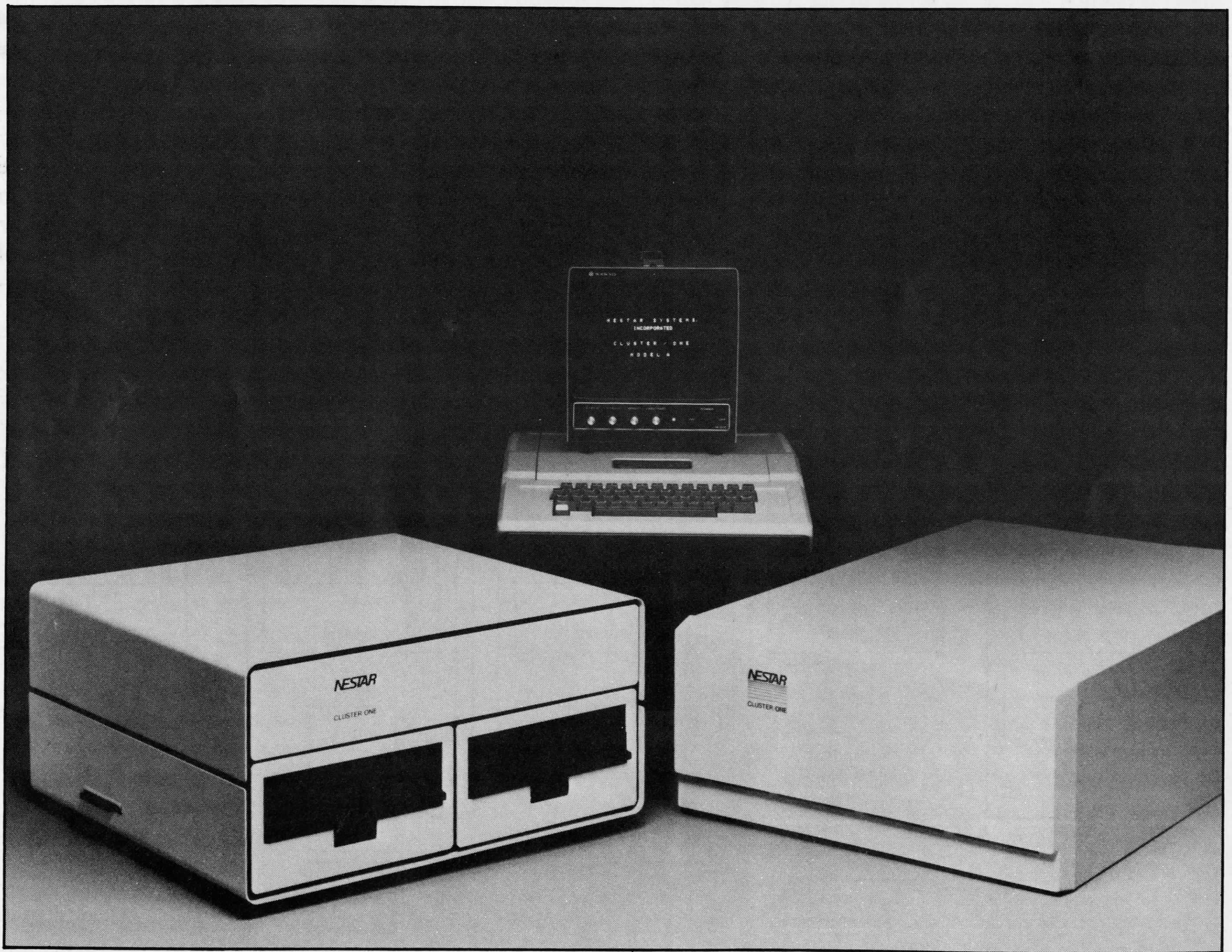
The central disk storage—a 14-in., 16.5M-byte Winchester—appears as a large set of virtual mini-disks, indistinguishable from the 5¼-in. floppy disks used at local Apple II stations. Nearly all the existing software for the Apple II runs without modification on the Cluster/One network. In addition, either the Pascal operating system or the standard disk operating system (DOS) for integer and Applesoft BASIC may be used. A Pascal program can have as many as six virtual mini-disks accessed at the same time, and a BASIC program can have as many as 255.

The Nestar interface card includes an Apple II interface, a bus transceiver, protocols in 2K bytes of ROM, 1K byte of buffer, an 8-bit address and recognition logic. Each station is uniquely addressable through the network interface hardware and logic.

User and service stations are connected in parallel along a 16-line unshielded bus that is tapped and connected to an interface card installed in an Apple II built-in expansion slot. In addition to the network interface card, a station may have interface cards in other expansion slots. Any station, then, may tie to printers, plotters, modems, floppy disks, hard disks, graphics tablets, card readers and the like.

A station may be either a user or a server, but not both simultaneously. Each user station can control external devices for its own local use. When these external devices are network resources, special server software residing in the station is then activated. A local device, such as a printer, remains locally available until the server software (which listens for requests for use of the printer) takes over and controls the printer allocation.

When operated in the network environment, the Apple II has better response than when used as a stand-alone station. Network printers, disk storage devices and other resources perform much better than those normally attached to the stand-alone Apple II and, in fact, when the system is heavily loaded, local



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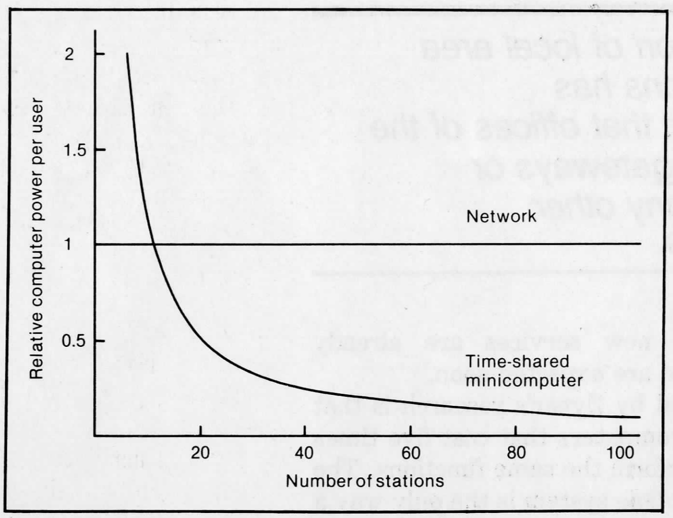

Fig. 2. Network power per user *is greater than time-shared minicomputer power per user.*

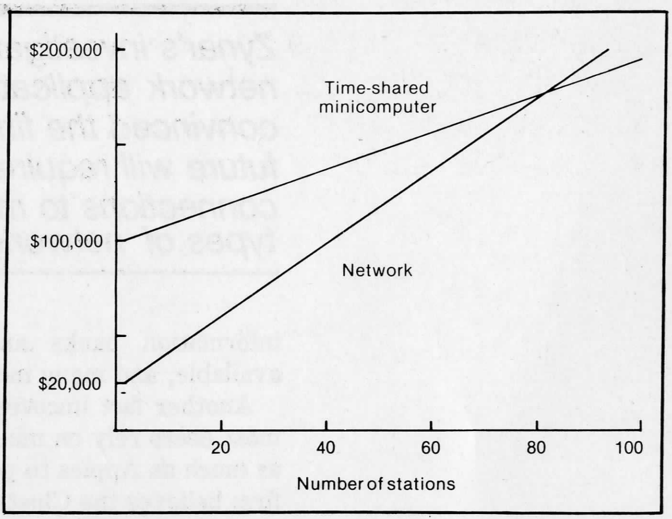

Fig. 3. Network costs are lower *than time-shared minicomputer costs when fewer than 80 stations are involved.*

station performance does not deteriorate below that normally achieved with the stand-alone.

Zynar's application

Zynar has 12 management and administration stations, and five for engineering functions. All are Apple IIs, used either as user or server stations. Networked resources, shared by all users, include three printers (including one of letter quality) and the Nestar 14-in., 16.5M-byte Winchester-disk drive. One server station interfaces the network to a modem for access to common carrier facilities, remote data bases and information services. Locally, a user station may have a minidisk (5¼-in. floppy) for private disk files. A high-quality color video monitor will be added to the network for displaying the graphical output of a financial planning package in development.

To reduce conflicts between engineering and corporate uses of Zynar's network, the system has been divided into business and engineering segments. A "gateway" between the independent networks is provided by a server station—an Apple II, designated to provide network-to-network communications.

Zynar plans to add a third segment for technical support functions such as incoming hardware test, systems test, burn-in and systems integration. This segment will also have a gateway to the main corporate network.

The payoff

With only 17 employees and two conventional typewriters, Zynar has been able to operate smoothly since it installed Cluster/One. Personnel and equipment costs have been kept down and managers have found that their staffs can handle more tasks with greater efficiency and a broader organizational overview than with traditional communication techniques. Rather than schedule meetings, issue memos and write formal reports, a general manager, for example, can easily obtain the marketing manager's most recent sales projections through the network. Managers have also found that by working with such an immediate information-processing network, employees have been forced to abandon their previous "batch processing" mentality and depend upon the network for real-time reporting and integration of selected data bases.

One application where Zynar found Cluster/One particularly useful was in cost updating. Costs are continually updated on the network so that quantitative decisions can be made quickly and accurately. Decision-making is pushed down to a lower organizational level than is typical in operations were data must be compiled, formatted and reported to an upper-level manager.

Integrating software

In addition to selling local computer network systems, Zynar markets applications software. The firm finds it must develop much of the software for those products, so its computing resources have always had to support engineering software development tasks as well as the business management and administrative functions.

Zynar has discovered that, although many software packages have been designed for the Apple II, these packages do not support multi-user mode operations. Although word-processing, electronic-mail and financial-planning and modeling functions are up and running, the firm finds it necessary to integrate software packages to derive the benefits of the network system. Therefore, Zynar's first task after installing Cluster/One was to extend the Apple II Pascal packages for multi-user functions on its engineering/development network. After these extensions were completed, engineers integrated a financial-planning package for in-house as well as commercial use.

Gateways are critical

Zynar's investigation of local area network (LAN) applications has convinced the firm that offices of the future will require gateways or connections to many other types of networks. External resources such as

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information banks and new services are already available, and many more are expected soon.

Another fact uncovered by Zynar's research is that most users rely on minicomputers that cost five times as much as Apples to perform the same functions. The firm believes the Cluster/One system is the only way a small business can organize its computing resources for growth. The addition of departments will entail adding new functions, new shared resources and many more feet of networking cable; this must be accomplished at low incremental cost per station. Moreover, network size must not be restricted. Nestar installation will allow each segment to have as many as 65 stations.

A minimal installation could include three stations (Apple II μcs) and 1.5M bytes of shared storage. This system could later be expanded to 10 stations for 16.5M bytes of storage with the 1.5M-byte disks as backup.

Zynar plans to upgrade its on-line hard-disk-storage to 33M bytes and will add local high-performance small disks at selected user stations. Printers, too, will be added as functions diversify. Colin Cook, Zynar's managing director, says, "The greatest need we face will be for more integrated applications packages and better gateways to interconnect with other networks."

Cook projects that the company will soon be able to connect the network to its customer's electronic mail systems for remote customer servicing. Zynar executives, too, will be remotely accessing company resources through their computer stations at home. And software developers will be able to "telecommunicate" to their jobs as the firm's operations and communications networks map to the needs of the company and its staff. ■

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